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ABSTRACT

Project DEBT (Developmental Education Birth through Two), an early identification and intervention program for handicapped and at risk children and their parents, is described. The Koontz Child Developmental Program, the core curriculum for instructional planning and intervention in DEBT, is reviewed, and new data are presented. It is explained that the Koontz Program is used to formulate long term goals, weekly objectives, and instructional activities. Three sources of data are examined in a study of DEBT's effectiveness with handicapped children: Koontz scores, developmental rates, and followup placement after graduation from DEBT. Parent involvement data and evidence of DEBT's relationship with the community human service delivery system are also evaluated. Results are said to indicate that DEBT's interventions were effective and successful. (Author/CL)

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The DEBT Project: Early Intervention for Handicapped Children and their Parents[1]

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Running head: DEBT

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The DEBT Project. Early Intervention for Handicapped Children and Their Parents

Running head: DEBT

Abstract

Project DEBT (Developmental Education Birth through Two), an early identification and intervention program for young handicapped (and at risk) children and their parents, is introduced and described briefly. The Koontz Child Developmental Program, the core curriculum for instructional planning and intervention in DEBT, is reviewed, and some new data are presented. Three sources of data were examined in order to assess evidence of DEBT's effectiveness with handicapped children: a) Koontz scores, b) developmental rates, and c) follow-up placement after graduation from DEBT. Parent involvement data and evidence of DEBT's attempt to interface with the community human service delivery system were also evaluated. Results indicated that DEBT's interventions were effective and successful.

The DEBT Project : Early Intervention for Handicapped Children and their Parents

During the past decade educators have witnessed the evolution of a multitude of early intervention projects for handicapped children. As DeWeerd and Cole (1976) pointed out, particular concentration has often been focused on projects involving children from birth to age three. At present, the literature contains numerous examples of early educational intervention programs whose effectiveness has been well documented (e.g., National Diffusion Network, 1980; Shearer & Shearer, 1972). The importance of and necessity for such programs has been highlighted by Hayden (1979), who commented that "While non-handicapped young children may make acceptable progress without early educational interventions, handicapped or at risk children do not" (p. 510, italics in original). Studies by McDaniels (1977) and Hayden, Morris, and Bailey (1977) have lent support to the contention that early educational intervention with handicapped children may correct or at least lessen the impact of various developmental conditions that impede or least deter student progress in later years. Despite these and other findings, resistance still exists on some fronts to the idea that children in this age group (and their parents) can benefit from such programs.

Simeonsson and Wiegerink (1975) have indirectly suggested a possible reason for such resistance. In discussing a "persistent dilemma" which confronts educators involved in early educational intervention programs, the authors stated that "The dilemma exists because on the one hand there is a strong belief that early intervention is essential and effective, while on the other hand there is the extreme difficulty of documenting effectiveness..." (p.474). Demands for program accountability in general have been increasing (Attkisson, McIntyre, Hargreaves, Harris, & Ochberg, 1974), and, in particular, specific communities also have been making consistent demands that social and educational programs provide both accountability (Wilderman, 1979) and precise evidence of effectiveness (Bagnato & Neisworth, 1980).

Although there has been a relative proliferation of early educational intervention programs, evaluation research and clear documentation of program effectiveness have not been incorporated routinely into the daily activities and priorities of many programs. The frequently noted lack of congruence between service and evaluation-research seems to be a possible source of resistance, and hence, a potential thesis for those who do not favor the replication or expansion of early educational intervention programs for handicapped children. Clearly,

then, a fertile avenue for research is the demonstration, documentation, and evaluation of unequivocal effectiveness in replicable early educational intervention programs.

This article, and the project described herein, arose out of an attempt to address and meet these issues. Our first purpose is to describe Project DEBT (Developmental Education Birth through Two), an early identification and intervention program currently operating in Lubbock, Texas. The second purpose is to present evidence of DEBT's effectiveness in improving developmental progress of handicapped and at risk children.

Project Description

Project DEBT is a home-based early intervention program for young handicapped children and their parents. Funded in 1974 as a demonstration program by the Bureau of Education for the Handicapped, Project DEBT is presently sponsored and supported by the Lubbock (Texas) Independent School District, under the auspices of the Department of Special Education. The major project goal is to provide early identification and intervention for handicapped and high risk infants age birth through two years. Additional objectives include improving parental interest and involvement, and integrating DEBT into the community human service delivery network.

The DEBT model was designed on four basic assumptions: a) early identification and intervention in the life of the exceptional child are critical and can influence and determine his/her future life, b) when provided with the proper resources, parents can be their child's most effective teacher, c) a warm and nurturing home creates the most productive atmosphere for learning and provides the best opportunity for individualized instruction and parental involvement, and d) assisting parents in locating community resources will decrease parental anxiety, confusion, and frustration (DEBT Staff, Note 1). Based on these assumptions, DEBT has provided a home training program designed to focus on augmenting parental skills necessary for teaching developmentally delayed children within the home.

DEBT serves children from birth through two who have had any of the following disabilities: speech and language deficit(s), physical disability, hearing impairment, mental retardation, visual impairment, emotional disturbance, developmental delay, and/or any other condition that may be viewed as high risk. Project enrollment is open to any eligible child regardless of family background or setting.

Eligibility for the DEBT Project is determined through an appraisal/placement process involving the following steps:

a) referral, b) age determination, c) parental consent, d) home observation, e) in-depth assessment, f) service, and g) follow-up. Approximately sixty-seven percent of the infants and children referred to the project have been eligible and enrolled in the DEBT Program.

The primary vehicle for delivery of services to children is the individualized educational program (IEP), which specifies long term goals, weekly objectives, and instructional activities for the handicapped child. The Koontz Child Developmental Program (Koontz, 1974) constitutes the core curriculum for instructional planning and intervention in DEBT. The Koontz program provides training activities for the first forty-eight months of life in the major areas of motor, social, and language development.

DEBT subscribes to the philosophy that parents are the child's best teacher. Paralleling the trend of parent involvement programs in special education (cf. Boyd, 1979; Feldman, Byalick, Rosedale, 1975; Kelley, 1973), the DEBT teachers visit each home weekly and work directly with the parent(s) and child in implementing the IEP. The parent receives assistance in improving parenting skills (cf. O'Connell, 1975) and in providing prescribed educational activities for the handi-

capped child (cf. Shearer & Shearer, 1972). Parental growth is fostered through parent meetings (Flint & Deloach, 1975), program presentations, coffees, and materials development workshops.

The DEBT model was designed to encourage parents to participate in the children's education beginning with the contribution of data to the assessment process and continuing through program planning and evaluation of progress. Records show that about 94% of the parents have attended IEP planning sessions, and 98% have assisted staff in measuring child progress (DEBT Staff, Note 2).

Other intervention includes the DEBT water play program which provides educational and recreational experiences for both the parents and children. A developmental curriculum for both water and gym play also has been developed. Additional direct services, which are available on an "as needed" basis, include physical therapy, occupational therapy, speech therapy, medical and educational evaluations, transportation, and materials lending libraries. The project also has provided temporary day care services and periodic follow-up of children graduating from DEBT.

In addition to routine interaction with community agencies and professionals, the DEBT staff has provided workshops for a

wide variety of human service workers. Texas Tech University also has offered graduate internships through the DEBT Project. Thus, the DEBT Project is a relatively comprehensive early intervention program for young handicapped (and at risk) children and their parents.

Evidence of Effectiveness

In order to assess the effectiveness of DEBT's intervention, five sources of data were examined: a) scores from the Koontz Child Developmental Program, b) developmental rates, c) follow-up placement after graduation from DEBT, d) parent involvement data, and e) evidence of interface with the community human service delivery network.

Subjects. Approximately 750 children were enrolled in Project DEBT during the 1974-78 academic years. For the present study, subjects were selected according to three criteria: a) availability of pre-and-post treatment Koontz scores, with at least a seven-month treatment interval between assessments, b) at least the potential for the child to show an increased performance (i.e., children with terminal medical diagnoses or whose sensory systems did not permit improvement were excluded), and c) a high probability of available follow-up data upon graduation from DEBT. One hundred and three DEBT children,

representing a wide variety of handicapping conditions, met the criteria and served as subjects.

The children were classified by DEBT staff according to severity of handicap involvement. The judgment was based on a composite of medical evaluations, teacher observations, and available developmental assessment scores (i.e., Koontz and Denver). Table 1 gives descriptive and demographic information on the three groups. The slightly lower average treatment time for the severely handicapped group was due to the more frequent need to interrupt project enrollment for hospitalization or emergency medical care.

Insert Table 1 About Here

Koontz Child Developmental Program. The Koontz Program includes up to 550 performance items for functional levels between one and forty-eight months of age. Subscales include gross motor (GM), fine motor (FM), social (S), receptive language (RL), and expressive language (EL). Total score reliability of the Koontz was reported to be .95, and inter-rater agreement for each subcale was reported as follows: gross motor .73, fine motor .78, social .78, and language (receptive and expressive combined) .82 (Koontz, 1974).

Performance items used in the Koontz were selected from many sources, including the Gesell Developmental Scale (Gesell, 1949), the Cattell Measurement of Intelligence of Infants and Young Children (Cattell, 1940), the Bayley Scales of Infant Development (Bayley, 1969), and "from experts in other fields" (Koontz, 1974, p.1), thereby supporting content validity of the Koontz. Schoen (Note 3), in an attempt to establish further the validity of the Koontz, found a correlation of .63 between the Koontz and the Bayley motor scale. A correlation of .69 was found between Koontz scores and the Bayley mental scale. These results further supported the criterion validity of the Koontz.

Since the Koontz Program constituted the core curriculum for instructional planning and intervention in DEBT, it was therefore one of the most appropriate measures of child progress. Pre-post developmental age Koontz scores are reported for 103 children served in the DEBT Project. Two types of scores were calculated: a) raw scores, and b) compensated scores. Compensated post scores were based on a procedure described by Irwin and Wong (1974) in order to adjust raw post scores to control for maturation. The computation for compensated developmental age (DA) was as follows:

$$\text{Compensated DA} = DA_{post} - (CA_{post} - CA_{pre}) \frac{DA\ pre}{DA\ post}$$

Hence, the above equation adjusted the post DA according to the length of the pre-post interval and to the pretest maturation rate.

Repeated measures analysis of Koontz raw scores showed that all three sample groups made very significant ($p<.001$; F-test) pre-post gains across all five performance areas. Results from the compensated scores showed that significant gains ($p<.01$) were made in all subscales (except gross motor) when scores were corrected for maturation and pre-post treatment interval.

Insert Table 2 About Here

These latter results were the same across the three groups (except for the Social Scale in the moderately handicapped group), indicating a generally consistent treatment effect across the range of handicap involvement. The absence of demonstrated effect on the gross motor scale was as expected, since remediation with this population was most diffcult in this area.

Developmental Rate. Table 3 gives the average ratio of developmental age (DA) to chronological age (CA) at pretest and posttest. The degree of pre-post improvement in the ratio of DA to CA (i.e., the developmental rate) might appear trivial

since the absolute change in ratios was relatively small. In fact, the F-test was not statistically significant. However, the observed pre-post changes in developmental rates represented up to four or five months of progress beyond expected levels. Since normal growth and development occur typically at an extremely rapid rate during the first two years of life, improvement of only one or two months would represent tremendous progress with this population. Thus, although quantitative analysis of developmental rates did not reveal a statistically significant effect, an effect of substantial practical significance was evidenced.

Insert Table 3 About Here

Prior research further demonstrated the significance of the gains observed in the three sample groups. In the area of language, Bricker and Bricker (1972) and Phillips and Balthazar (1979) found that without intervention, the developmental rates of severely handicapped children deteriorated over time, and other researchers (e.g., Carr, 1977; Cornwell & Birch, 1969; Dicks-Mireaux, 1972) reported a consistent downward trend in developmental progress of retarded infants and children, if intervention was not available. These findings emphasized the significance of the pre-post improvement in developmental

rates in all three DEBT sample groups, and especially for those observed for the severely handicapped sample.

Follow-up Placement. Upon a child's enrollment in the DEBT Project, staff members were asked to predict the child's eventual placement if intervention were unavailable. These subjective judgments constituted the basis for "anticipated" child placement. As of May, 1980, 91 of the 103 sampled children had graduated beyond the DEBT Project, and follow-up placement data were available for 86 of these children. Comparison of anticipated and actual placement is presented in Table 4.

Insert Table 4 About Here

A chi-square one sample test revealed a statistically significant difference ($x^2(4) = 79.75$, $p<.001$) between actual and anticipated placement. It was noteworthy that almost one third (31%) of the DEBT graduates was placed totally in a regular classroom, when only 19% was expected to have been placed in that setting. Only five percent was placed in a special non-residential or residential placement, when 22% was the expected incidence for such placement. Of special interest is the fact that approximately one fifth (19%) of the children remained in the home setting, whereas none (0%) was expected to remain there.

These results showed a substantial positive effect over what project staff initially anticipated for these children. The apparent discrepancy between actual and anticipated percents for resource room placement was due to the large number of DEBT graduates in special education early childhood classrooms, since children younger than five years did not typically have opportunity for placement in resource rooms or regular classrooms. Otherwise, most of these children would have been in resource room placements.

Parent Involvement. The DEBT Project has developed and presented a wide range of training and involvement activities for paents, and these have used extensive professional resources including project staff, university consultants, and community and parent leaders.

From 1974 to 1978 project staff have presented 300 training workshops, and more than 250 parents have participated in the home training program. More than 100 parents have attended special training workshops, and numerous parents have visited related service settings and have used the DEBT resource library. Extraordinary parent involvement was evidenced in that: a) approximately ten parents have given program presentations to local organizations, b) fifteen parents

served on the DEBT Advisory Council, and c) twenty parents served as consultants to other parents.

Interface with the community human service delivery network. In order to develop community awareness, DEBT disseminated a wide variety of printed materials. Records indicated that 35,601 newsletters, 6,500 brochures, and over 215 information packets were distributed among the community during the years 1974-78. A second DEBT strategy for building community awareness was to conduct on-site visits (n=186 groups) and to deliver program presentations to varied audiences (n=130). Additionally, twelve television shows concerning the DEBT Project were televised. Thus, DEBT has developed and employed a variety of media aids and strategies for the purpose of developing community awareness.

A variety of other DEBT activities have assisted its integration into the community human service delivery network. DEBT provided ten workshops for college students, and ten students have received college credit for intership in the DEBT Project. More than 44 training sessions were presented to secondary public school students, and 52 workshops were held for expectant teenagers. DEBT also participated in the state-wide consortium for infant education, and shared in the

planning, conducting, and evaluation of three regional conferences on infant education. Another significant measure of success was DEBT's initiative in the formation of the South Plains Information and Referral Board, a systems approach to service coordination among the health, education, and welfare agencies in the Lubbock region. Additionally, the DEBT Project has recruited and provided training for volunteers from area groups.

In order to assess the degree of DEBT integration in the community service network, a telephone survey of Lubbock physicians and human service workers (n=77) revealed that 85% were aware of DEBT; three-fourths had read at least one DEBT material; over half (54%) had referred a child to DEBT; slightly less than half (45%) had visited the DEBT Office; and more than one-third (35%) had attended a DEBT workshop. These results support the contention that DEBT has interfaced successfully with the community human service delivery network.

Conclusion

Measures of developmental progress and followings of DEBT graduates indicated that the DEBT Project provided effective intervention in the lives of handicapped children and their families. Three sources of data attested to DEBT's

effectiveness with the three sample groups: a) statistically significant improvement in Koontz (raw and compensated) scores b) improvement in developmental rates, and c) favorable student placements upon DEBT graduation. Other data supported DEBT's success in parental involvement and in its successful interface with the community human service delivery network

Additional indices of DEBT's success and effectiveness were available. A most noteworthy measure of DEBT's success was that the Lubbock Independent School District opted to continue funding the Project after federal funding ceased. The favorable decision to continue the project was based in large part on the cost effectiveness of the DEBT Model. A second index of success and effectiveness was evidenced in the recent endorsement and approval of the DEBT Project by the Joint Dissemination Review Panel (JDRP) of the Education Division, National Institute of Education and Office of Education. In effect the JDRP endorsement approved the DEBT Project for national dissemination as a program exemplifying both effectiveness and quality control. A synthesis of available data suggests soundly that DEBT's interventions were, in fact, effective and helpful.

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chology, 1979, 7, 93-106.

TABLE I

Sample Groups for Koontz Data

Handicapped Group	Sex Male	Sex Female	Ethnic[a] Group	SES[b]	Pretest CA[c] $\bar{X}$	Pretest CA[c] SD	Months in Treatment $\bar{X}$	Months in Treatment SD	Months in Treatment Range
Severe N=31	17 (55%)	14 (45%)	A 20 (64%) M 8 (26%) B 3 (10%)	L 3 (10%) ML 4 (13%) UL 5 (16%) M 14 (45%) UM 5 (16%)	14.94	9.10	13.7	5.5	7-27
Moderate N=23	17 (74%)	6 (26%)	A 11 (48%) M 7 (30%) B 4 (18%) O 1 (4%)	L 4 (17%) ML 6 (26%) UL 5 (22%) M 6 (26%) UM 2 (9%)	19.17	9.82	14.8	5.0	8-25
Mild At Risk	33 (67%)	16 (33%)	A 25 (51%) M 16 (33%) B 8 (16%)	L 11(22.5%) ML 13(27%) UL 11(22.5%) M 9(18%) UM 5(10%)	15.31	8.53	15.2	4.7	8-26

[a]A=Anglo; M=Mexican-American; B=Black; O=Other

[b]SES=socioeconomic status: L=lower; ML=middle lower; UL=upper lower; UM=upper middle

[c]CA= chronological age

Table 2

Analysis of Koontz Scores

Sample Group	Scale		Compensated Scores (months) Average DA Pre	Average DA Post	Average Gain	ANOVA Summary[a] MS	F	P
Severely Handicapped (N = 31)	GM	$\bar{X}$	8.00	9.43	1.43[d]	31.56[b]	2.31	NS
		SD	6.63	6.84		13.64[c]		
	FM	$\bar{X}$	7.87	13.29	5.42	454.79	25.61	<.001
		SD	6.47	8.67		17.76		
	S	$\bar{X}$	8.97	13.57	4.60	328.62	10.97	<.01
		SD	7.83	8.33		29.96		
	RL	$\bar{X}$	7.29	12.04	4.75	349.25	8.84	<.01
		SD	6.31	10.10		39.52		
	EL	$\bar{X}$	6.42	10.29	3.87	232.42	6.05	<.05
		SD	6.00	9.11		38.44		
Moderately Handicapped (N = 23)	GM	$\bar{X}$	15.35	15.90	0.55[d]	3.52	0.13	NS
		SD	8.77	10.73		26.82		
	FM	$\bar{X}$	16.35	21.15	4.80	265.24	11.48	<.01
		SD	8.91	10.04		23.10		
	S	$\bar{X}$	17.30	19.60	2.30[d]	58.99	1.56	NS
		SD	9.14	10.01		37.76		
	RL	$\bar{X}$	14.52	21.98	7.46	640.22	15.32	<.01
		SD	8.42	10.66		41.79		
	EL	$\bar{X}$	12.78	20.20	7.42	632.34	14.98	<.01
		SD	7.17	12.26		42.21		
Mildly Handicapped/ At Risk (N = 49)	GM	$\bar{X}$	14.84	16.04	1.20[d]	35.10	1.04	NS
		SD	7.87	9.07		33.62		
	FM	$\bar{X}$	14.02	17.90	3.88	360.25	16.29	<.01
		SD	7.34	8.84		22.61		
	S	$\bar{X}$	14.84	18.40	3.56	311.18	11.93	<.01
		SD	7.91	9.02		26.08		
	RL	$\bar{X}$	13.61	16.67	3.06	231.40	6.76	<.05
		SD	6.97	9.92		34.23		
	EL	$\bar{X}$	12.27	17.28	5.01	615.00	18.46	<.001
		SD	6.07	9.95		33.31		

[a]Degrees of freedom for F-tests were 1,30 for severely handicapped, 1,22 for moderately handicapped, and 1,48 for mildly handicapped/at risk.

[b]Variance due to pre-post effect.

[c]Variance due to residual error term.

[d]Not statistically significant.

TABLE 3

Developmental Rates at Pre and Post Tests[a]

Handicap Group		Average DA/CA				
		GM	FM	S	RL	EL
Severe	Pretest	.55	.53	.58	.48	.45
	Posttest	.61	.71	.77	.64	.57
Moderate	Pretest	.84	.87	.92	.79	.70
	Posttest	.86	1.01	.99	.98	.86
Mild/At Risk	Pretest	.99	.94	.98	.92	.84
	Posttest	1.04	1.10	1.10	1.02	1.00

[a] GM= gross motor; FM=fine motor; S=social; RL=receptive language; EL=expressive language

TABLE 4

Follow-Up Placement Data for 86 DEBT Graduates[a]

Placement	Anticipated		Actual	
	N	%	N	%
Regular Education	16	(19%)	27	(31%)
Resource Room-Special Education	37	(43%)	3	(3%)
Self-contained class-Special Education(includes early childhood classrooms)	14	(16%)	36	(42%)
Special nonresidential placement	9	(10%)	4	(5%)
Residential placement	10	(12%)	0	(0%)
Home[b]	0	(0%)	16	(19%)

[a] $\chi^2(4)=79.75$, $p < .001$

[b] Since the anticipated (viz., expected) frequency of the "Home" category was less than 1, this category was combined with the "Residential Placement" category for purposes of the chi-square analysis only (cf. Siegal, 1956, p. 46).